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TASC ASTT TECHNICAL AND MANAGEMENT MONTHLY PROGRESS REPORT

Progress Report for the Period:

1 December – 31 December 1997

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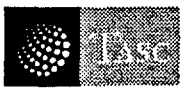


1. INTRODUCTION

This report provides a summary of the progress made during the report period under TASC's three ASTT (Advanced Simulation Technology Thrust) projects:

- MRA (Multiresolution Analysis), CLIN 0001/0002, Whitney
- JETS (JSIMS Environmental Tailoring), CLIN 0003/0004, Ouzts
- FROST (Framework of Reusable Objects), CLIN 0005/0006, Stanzione.

This report contains both Technical (Section 2) and Management / Financial (Section 3) status information, reported individually for each of the three projects.

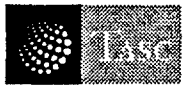
2. TECHNICAL SUMMARY

2.1 MRA - MULTIRESOLUTION ANALYSIS (CLIN 0001/0002)

2.1.1 Technical Accomplishments

During November, the MRA staff implemented our first subsystem-level scenario experiment for investigating candidate Measures of Consistency (MOCs) for use in developing guidance for SNE developers under JSIMS. The scenario involves a simulated encounter between a single tank (Blue Force) and a small platoon of enemy tanks (Op Force). Using terrain data extracted from the STOW'97 region, we generated interpolated and sub-sampled (median filtered) terrain data sets with different spatial resolutions then analyzed intervisibility between the opposing forces at each resolution. We included our first results in a paper to be presented at the Spring '98 SIW.

The MOC used for this first experiment, based on a measure widely used in other communities, provided useful quantification of the dependence of consistency between results using different terrain resolutions. Results presented in the paper included the interaction between the assumed acquisition range of the two forces and the terrain. For the specific force corridors assumed, MOC values tended to decrease as the acquisition range increased, although the relationship is not monotonic for the specific simulated scenario.



2.1.2 Results Obtained Related to Previously Identified Problem Areas

Not applicable.

2.1.3 Technical or Schedule Problem Areas

None.

2.1.4 Activities Planned for the Next Reporting Period

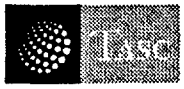
During January we will continue experiments based on the tank force scenario. We will also begin implementing two more experimental scenarios, one based on the attack-aircraft vs. SAM site encounter described last month and the second on an encounter between two patrolling submarines. These experiments, like the on-going first experiment, are designed to assess the suitability of candidate MOCs in each case and to begin developing guidance regarding the required SNE complexity for successful interoperability between different simulators in a federation.

2.2 JETS - JSIMS ENVIRONMENTAL TAILORING SERVICES (CLIN 0003/0004)

2.2.1 Technical Accomplishments

We continued work on two basic efforts: (1) identifying requirements for tailoring to support training needs in support of completing the requirements documents and (2) configuring a numerical weather prediction (NWP) model for initial testing and evaluation. The first of these will lead to *The Environmental Tailoring Requirements Report* scheduled for completion by February 1998. The second of these will feed directly into the numerical tailoring algorithm work in FY 98.

We implemented one numerical weather prediction (NWP) model at TASC and expect to have another running shortly. A set of weather analyses was downloaded from MEL (NORAPS model) and will be used to initialize the NWP experiments and to test merging algorithms. For the requirements analysis we are presently consolidating environmental data elements identified by the Air and Space Natural Environment Executive Agent, STOW'97 participants, and JSIMS federates. We completed the JETS paper for the 1998 Spring SIW Conference.



During FY 97, the JETS team determined the state of the art in environmental tailoring, defined the key tailoring issues affecting simulation fidelity, and began analysis of requirements in modeling and simulation systems (legacy and planned systems) for environmental tailoring.

2.2.2 Results Obtained Related To Previously Identified Problem Areas

Not applicable.

2.2.3 Technical or Schedule Problem Areas

None.

2.2.4 Activities Planned for the Next Reporting Period

In the next weeks, we will be preparing for the January IPR. At the January IPR, we hope to be able to use an SNE generated from some familiar numerical weather model (*e.g.*, NORAPS or NOGAPS) to:

1. Perform some simple (parameterized) blending on one variable
2. Place a plug from a pre-computed scenario
3. Nudge a NWP model input field to produce the desired tailored results

The idea is to compare and contrast these techniques focusing on the issues JETS is attempting to resolve. Currently we are focusing on extending our Example #2 from the last IPR (adding a fog bank to reduce visibility) and looking at the calculation of variables like inter-visibility and ground mobility for the various tailoring methods.

2.3 FROST - FRAMEWORK OF REUSABLE OBJECTS (CLIN 0005/0006)

2.3.1 Technical Accomplishments

Tom Stanzione, Alan Evans, and Forrest Chamberlain continued generating documentation in the form of a white paper which describes why the distributed SNE problem is hard, how the proposed JSIMS architecture supports or does not support the SNE problem, and recommendations for further experiments that the FROST program can undertake to help solve

the problems. We delivered a draft version of this document to Paul Birkel on December 20th. Forrest also developed a list of issues associated with the FROST approach and a list of experiments to be performed to address these issues.

Robert Coury continued the analysis of various platform and unit level simulation systems, as well as a C4I system, in order to generate the Environmental Interface and Ground Truth Environmental Database specifications. We plan to have a draft version of the EI Specification in early January.

Eric Yee and Howard Lu started investigating the SAIC simulation infrastructure software Tempo/Thema, for use in FROST experiments. They implemented several programs to test the capabilities of the current version. These test programs included extraction of SNE data from an intermediate database (IDB), event handling between 2 entities, and multiple producers and consumers of data. They also started investigating COTS object oriented database products for potential application in FROST, including ODI's ObjectStore and Oracle's Spatial Data Cartridge.

2.3.2 Results Obtained Related to Previously Identified Problem Areas

Not applicable.

2.3.3 Technical or Schedule Problem Areas

None.

2.3.4 Activities Planned for the Next Reporting Period

We will continue writing the white paper and will focus on the current JSIMS architecture and how FROST fits into it. Also, the analysis of commercial off-the-shelf database products will be continued. We will continue with the FROST experimentation, and complete the EI and GTEMs specification from the requirement analysis.

3. MANAGEMENT AND FINANCIAL SUMMARY

3.1 MRA (CLIN 0001/0002)

3.1.1 Cost Element Problem Areas

3.1.2 Program Financial Status*

Work Breakdown Structure or Task Element	Cumulative to Date ($)** Planned Expend	Actual Expend	% Compl	At Completion ($)*** BAC	LRE	Remarks
TOTAL FY97-99 CLIN 0005/0006	265,000	263,796	17%	1,560,746	1,560,746	

*** Includes both funding in-hand (FY 97-98) and planned (FY 99).**
**** Excludes cost of money.**
***** Excludes fee and cost of money.**

Based on currently authorized work:

(1)	Is current funding sufficient for the current FY	Yes
(2)	What is the next Fiscal Year's funding requirement at anticipated levels	$720K
(3)	Have you included in the report narrative any explanation of the above data and are they cross-referenced ?	No

3.1.3 Travel and Meetings

Date	Location	Subject

None.

3.1.4 Any Significant Changes to the Contractor Organization or Method of Operation

None.

3.1.5 Summary of Engineering Change Proposal (ECP) Status

None.

3.2 JETS (CLIN 0003/0004)

3.2.1 Cost Element Problem Areas

We went at risk in December 1997 based on DARPA assurances of FY 98 funding to be released in late December or early January.

3.2.2 Program Financial Status*

Work Breakdown Structure or Task Element	Cumulative to Date ($)** Planned Expend	Actual Expend	% Compl	At Completion ($)*** BAC	LRE	Remarks
TOTAL FY97-99 CLIN 0003/0004	154,250	154,241	23%	621,413	621,413	

*** Includes both funding in-hand (FY 97-98) and planned (FY 99).**
**** Excludes cost of money.**
***** Excludes fee and cost of money.**

Based on currently authorized work:

(1)	Is current funding sufficient for the current FY	Yes
(2)	What is the next Fiscal Year's funding requirement at anticipated levels	$250K
(3)	Have you included in the report narrative any explanation of the above data and are they cross referenced ?	No

3.2.3 Travel and Meetings

Date	Location	Subject
2-3 Dec	San Diego CA	Battlespace Atmospherics Conference

3.2.4 Any Significant Changes to the Contractor Organization or Method of Operation

None.

3.2.5 Summary of Engineering Change Proposal (ECP) Status

None.

3.3 FROST (CLIN 0005/0006)

3.3.1 Cost Element Problem Areas

We received GFY 98 funds in December.

3.3.2 Program Financial Status*

Work Breakdown Structure or Task Element	Cumulative to Date ($)**			At Completion ($)***		
	Planned Expend	Actual Expend	% Compl	BAC	LRE	Remarks
TOTAL FY97-99 CLIN 0005/0006	210,419	220,422	19.5%	1,128,752	1,128,752	

*** Includes both funding in-hand (FY 97-98) and planned (FY 99).**
**** Excludes cost of money.**
***** Excludes fee and cost of money.**

Based on currently authorized work:

(1)	Is current funding sufficient for the current FY ?	Yes
(2)	What is the next Fiscal Year's funding requirement at anticipated levels	$530K
(3)	Have you included in the report narrative any explanation of the above data and are they cross referenced ?	No

3.3.3 Travel and Meetings

Date	Location	Subject

None.

3.3.4 Any Significant Changes to the Contractor Organization or Method of Operation

None.

3.3.5 Summary of Engineering Change Proposal (ECP) Status

None.